

## **REMARKS**

### **Status of the Claims**

In light of the provisional election without traverse relating to Group I made on April 8, 2008 with the Examiner, Claims 1-5 and 14-17 are pending with claims 1 and 14 being the independent claims. Applicants affirm this election and believe no fees are due in response to the first action on the merits mailed by the Examiner on April 25, 2008. Claims 6-13 and claims 18-19 had been withdrawn in response to the restriction requirement and are cancelled herewith.

Claims 2-3 are rejected under 35 U.S.C. 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

Claims 1-5 and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Gordon et al (USP 5,398,539) (“Gordon”).

Claims 1-5 and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Goulden et al (Improvement of Identification in the Gas-Liquid Chromatographic Analysis of Agricultural Samples for Residues of some Chlorinated Pesticides, Analyst, Vol. 88, pgs. 941-950, 1963) (“Goulden”).

### **Overview**

Independent claims 1 and 14 relate to a method of characterizing a mixture of components and a method of resolving a mixed sample of chromatographic components, respectively. As amended each claim recites the step of “performing spectral component matching.” Applicants submit that this step is not taught in the documents of record cited by the Examiner. Specific details relating to spectral component matching are provided, in part, in paragraphs [0041] and [0048] of the specification.

In addition, claims 1 and 14 have also been amended to recite that “each spectrochromatogram comprises a plurality of absorbance values” and “the spectrochromatographic data comprising a plurality of absorbance values,” respectively, to further clarify the nature of the spectrochromatograms and data of interest with respect to the claimed spectral methods.

## *Response to Rejections*

### **Rejection of Claims 2-3 Under 35 U.S.C. § 112**

In response to the 35 U.S.C. § 112 rejection of claims 2 and 3, Applicants have amended both claims to clarify the scope of each claims. Applicants submit that both claims are and were definite and respectfully request removal of the 35 U.S.C. § 112 rejection.

### **Rejection of Claims 1 – 5 Under 35 U.S.C. § 102(b) with respect to Gordon and Goulden**

In general, embodiments of the invention relate to characterizing or resolving mixtures of components using peak matching techniques and processing spectral data such as spectrochromatographic data. Many of these features are introduced in paragraph [0008]. Specifically, paragraph [0008] provides as follows:

The term peak generally refers to a concentration profile of an individual analyte while it passes through a chromatographic detector, as a result, the detector(s) produce a signal that is recordable. **Modern spectral detectors record multiple signals at the same time (e.g., absorbance at many wavelengths) and thus can produce a matrix of data instead of a classical chromatographic curve with peaks.** As used herein, the term spectrochromatogram refers to a matrix of data representing an individual chromatographic separation (run). (emphasis added)

Clearly, the focus on the invention relates to the use of spectral detection to generate spectrochromatograms. This is also the case with independent claim 1.

Specifically, claim 1 recites as follows:

A method of characterizing a mixture of components, the method comprising the steps of: obtaining ***a plurality of spectrochromatograms*** of the mixture of components, each of the spectrochromatograms being obtained under a respective one of a plurality of different chromatographic conditions, ***each spectrochromatogram comprises a plurality of absorbance values;*** estimating the number of components and ***performing spectral component matching upon the spectrochromatograms*** using the estimated number of components ***and the plurality of absorbance values.*** (emphasis added)

***Gordon***

With respect to Gordon, it is clear that performing spectral component matching is not described in or suggested by the reference. Gordon does not mention the use of a *spectrochromatogram that refers to a matrix of data representing an individual chromatographic separation (run)* or that contains a plurality of *absorbance values* as recited in amended claim 1. Further, Gordon fails to teach a spectral approach. Gordon certainly fails to teach performing spectral component matching upon the spectrochromatograms using the estimated number of components. In Gordon, a chromatographer is using his or her personal experience and knowledge to perform individual experiments. To the extent those experiments are evaluated together, in Gordon, the evaluation occurs by a chromatographer drawing lines with a pencil and guessing as to which peaks match. This renders the approach of Gordon of limited use.

In contrast, the Applicants spectral based approach allows for large data sets to be collected with respect to a plurality of spectrochromatograms such that components can be spectrally matched between the spectrochromatograms. This is not possible using Gordon's pencil and guesswork based approach. Gordon's failure to include a spectral based approach renders Gordon inapplicable to the pending claims. Certainly, Gordon fails to teach “**performing spectral component matching** upon the spectrochromatograms using the estimated number of components **and the plurality of absorbance values.**”

Accordingly, Applicants submit that claim 1 is not anticipated and is therefore patentable over Gordon. Applicant further submits that claims 2-5 which depended from claim 1 are also patentable as depending from a patentable base claim.

***Goulden***

In general, Goulden fails to describe a spectral focused approach such as that claimed by the Applicants. Specifically, on page 945 of Goulden, the reference recites

The chromatograms so produced we have tentatively called "spectrochromatograms," because they are indicative of the spectrum of selectivity of the various stationary phases towards individual chlorinated pesticides.

From this passage, it is clear that Goulden's usage of the term, "spectrochromatograms" and that of the Applicants differ. As recited above with respect to paragraph [0008] and independent claim 1 itself, the spectrochromatograms claimed include absorbance values and are represented as "a matrix of data representing an individual chromatographic separation (run)."

In addition, Goulden is not interested in absorbance values and wavelength data. As was the case with Gordon, Goulden's failure to include a spectral based approach renders Goulden inapplicable to the pending claims. Certainly, Goulden fails to teach "**performing spectral component matching** upon the spectrochromatograms using the estimated number of components **and the plurality of absorbance values.**"

Accordingly, Applicants submit that claim 1 is not anticipated and is therefore patentable over Goulden. Applicant further submits that claims 2-5 which depended from claim 1 are also patentable as depending from a patentable base claim.

**Rejection of Claims 14-17 Under 35 U.S.C. § 102(b) with respect to Gordon and Goulden**

With respect to the rejection of claim 14 under 35 USC 102(b), claim 14 recites:

A method for resolving a mixed sample of chromatographic components, the method comprising the steps of:

selecting *a plurality of differing chromatographic conditions*;

*performing a plurality of chromatographic runs on the mixed sample*, each respective run performed under *a respective chromatographic condition*;

obtaining spectrochromatographic data for the mixed sample during each of the

chromatographic runs, *the spectrochromatographic data comprising a plurality of absorbance values*;

creating an *augmented data set* from the spectrochromatographic data of the plurality of chromatographic runs;

operating on the augmented data set to *determine the retention times for each component in the mixed sample*;

*performing spectral component matching upon the spectrochromatographic data*; and resolving each of the components.

For the same reasons discussed above, neither Goulden nor Gordon describe a spectral based approach such that spectrochromatographic data or spectrochromatograms include a plurality of absorbance values wherein spectral component matching is performed.

Accordingly, Applicants submit that claim 14 is not anticipated and is therefore patentable over the prior art of record. Applicant further submits that claim 15-17 are also patentable as depending from a patentable base claim.

Therefore, Applicants submit that the pending independent claims and claims dependent therefrom are patentable over both Gordon and Goulden and respectfully request reconsideration and withdrawal of the rejections.

### **CONCLUSION**

Applicants submit that on the basis of the foregoing claim amendments, claims 1-5 and 14-17 are in condition for allowance. Should any further issues of anticipation or patentability be determined to exist, the Examiner is invited to contact the undersigned by telephone to expedite the favorable prosecution of this application.

In light of the foregoing, we submit that all claims are now in condition for allowance.

Respectfully submitted,

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